REMARKS

Reconsideration of the application is requested.

In view of MPEP 707.07 that requires the action to be complete as to all matters, Applicant proceeds under the understanding that the present claims are patentable once the distinction set forth herein over the cited prior art is established.

I. REJECTIONS UNDER 35 USC 103(a)

The current Office Action has set forth two rejections under 35 USC 103(a). Applicant will address each rejection below.

A. REJECTION OF CLAIMS 1, 2, 5, 6, 17, 34, 38, 44, 75, 116, 137, 139, 144, 151, 152, 160, 161, 169, and 175

The current Office Action, on pages 6-11, asserts a rejection as the claimed invention being obvious in view of the cited Henriksen and Geselowitz references of record.

Applicant respectfully traverses this rejection.

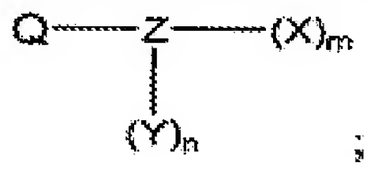
Currently pending claim 1 requires, inter alia:

> selecting a small organic molecule drug whose non-target proteins with which it interacts are to be identified, and providing a capture compound that

presents the drug or a fragment, intermediate, metabolite or prodrug of the drug whose non-target proteins are to be identified, wherein:

the drug, the fragment, intermediate, metabolite or prodrug of the drug interacts with a non-target protein of the drug;

the capture compound has the formula:



;

X is a photoactivatable group that, upon exposure to light, covalently binds to an amino acid side chain of a protein to effect covalent binding of the capture compound to a protein;

Y is the small molecule organic drug or a fragment, intermediate, metabolite or prodrug thereof for assessing interactions with non-targets;

Q is a sorting function for immobilizing or separating the capture compounds

and

Z is a trifunctional amino acid that presents each of X, Y and Q;

m is 1; and

n is 1;
(currently amended claim 1, emphasis added).

Applicant respectfully asserts that currently amended claim 1, as will be set forth below, is distinct from the cited references.

Applicant acknowledges that the current rejection is based on the combined disclosure of the cited references. Applicant will demonstrate the deficiencies in each reference and conclude with an analysis of the cited references as a single disclosure.

The primary reference to Henriksen not only cannot be used to support an obviousness rejection, but the reference itself teaches away from the present invention.

In Henriksen, the only structure with any similarity to the present invention is structure 8, in scheme 1 on page 333. However, when a person of ordinary skill in the art reviews the Henriksen reference, Table 1, on page 338, lists the tested reagents and the results. Structure 8, in column BSA as the **lowest** AP test value, which would be the test most instructive in relation to the present invention. In other words, the only structure even remotely related to the present invention performed the worst! Thus, this would teach away from the present invention and would not lead a person of ordinary skill in the art to use such structures because of the poor performance.

Additionally, paragraph 3 on p 337 of Henriksen ("biotinylation of proteins was performed…") allegedly provides for "contacting capture compounds with a sample containing non-target proteins." This interpretation is incorrect; Henriksen does not discriminate target- and non-target-proteins. The paper, as a whole, is about reaction of photo probes with nucleic acids (see discussion). Where proteins are considered, the specificity of the photo biotinylation reaction is determined (p 340, 3rd paragraph "In order to examine…"). If anything, different reagents are tested against one protein (bovine serum albumin BSA). The last paragraph of Henriksen the discussion on p 341 would indicate to the skilled person that the methods and reagents of Henriksen are not suited to the purpose of the instant invention as Henriksen explicitly states "…all of the new photobiotinylation reagents…are more indiscriminate…" (than previous methods based on NHS-biotinylation).

The Office Action further purports that, Henriksen also provides for determining the identity of captured proteins. What Henriksen shows is submitting proteins after reaction with the biotinylation agent to electrophoresis, and subsequently developing the blotted gels by binding a detectable streptavidin (I125 or alkaline phosphatase, see Nr. 3, 3rd paragraph on p 337).

This does not amount to determining the identity of the blotted proteins –it was known all along what proteins were in the mixture, and where they would blot, but to determining relative reaction efficiencies between reagent and protein.

In summary, Henriksen does not provide a method that is able to identify proteins based on differential binding to a drug substance, but only discloses reactivity of general-purpose linker molecules for protein or nucleic acid functionalization.

Henriksen is deficient for failing to teach or suggest the present invention, and is further deficient for teaching away from the claimed invention.

The Office Action then combines Henriksen with Geselowitz to assert an obviousness rejection. This combination is deficient as will be shown below.

Geselowitz, as a whole, is directed and operable only with nucleic acids. It is not possible to use the methods of Geselowitz with proteins.

Combination of Henriksen with Geselowitz would teach non-analogous structures that are used in nucleic acid based methods. This combination of the two references, into a single instructive disclosure is deficient for failing to teach, suggest or provide any motivation to modify in order to arrive at the subject invention as now claimed. Because of these deficiencies, an obviousness rejection under 35 USC 103(a) cannot be properly maintained. Applicant respectfully requests reconsideration and withdrawal of this rejection.

B. REJECTION OF CLAIMS 10, 110, 163, 164, AND 166

The Office Action, on pages 11-13 sets forth a second rejection based on the combined disclosure of the aforementioned Henriksen and Geselowitz reference, in view of the cited Particelli reference.

Applicant respectfully traverses this rejection.

Henriksen and Geselowitz references are deficient as set forth above.

Combination with Particelli fails to cure the deficiency.

Particelli teaches mass spectrometry analysis of "activity based probes" conjugates with proteins, Particelli does not teach what such activity based probes are.

What little structural information there is about activity based probes in Particelli, relates to a linear set-up of a reactive function for covalent linking (termed F in Particelli, see par. 0049 to 0051), which also has the function of providing specificity of the molecule. Hence, Particelli does not disclose the central feature of

the instant invention, the threefold functionalized capture compound with a selectivity function (drug) distinctly separated from the reactivity function for covalent linkage to the target protein, and a third function (Q, Biotin in the examples) for retrieval.

This difference results in Particelli and related patents enabling only the interrogation of certain protein classes that are addressable by reactive probes that couple directly to the active site. This greatly restricts the breadth of questions that can be addressed. The instant invention, on the other hand, de-couples the selectivity, which determines what proteins are addressed, and their reactivity function, which is attached to the molecule independently, covalently links to a site on the target protein away from the active site, and hence allows for unbiased, mechanistically unrestricted interrogation of the proteome.

The problem to be solved by Particelli is the identification of active proteins in a complex protein mixture (par. 0009, 1st sentence). There is no teaching or suggestion in Particelli as to how the skilled artisan would be motivated to combine this general thrust, and the procedural features of Particelli, with the specific compounds of Henriksen or Geselowitz, because the former are inefficient in coupling to proteins, and the latter do not address protein interaction at all, being entirely restricted to nucleic acid interaction.

Thus, once the three cited references are combined into a single instructive disclosure, they only teach nucleic acid, non-related structures, and linear set-up of a reactive function for covalent linking. An ordinarily skilled artisan would find no

teaching, suggestion, or motivation to combine the references of Henriksen and Geselowitz, in view of the cited Particelli reference, to arrive at the invention now claimed. Because of these deficiencies, an obviousness rejection under 35 USC 103(a) cannot be properly maintained. Applicant respectfully requests reconsideration and withdrawal of this rejection.

REJECTIONS UNDER 35 USC 112

The Office Action, on pages 13-16 provides four separate rejections under 35 USC 112. Each will be addressed below.

Claim 1

The Office Action notes that the claim limitation added by amendment that "Z contains 50 or fewer atoms" is not found in the specification. While Applicant may disagree with this position, in order to expedite prosecution, claim 1 has been amended to more distinctly claims, "Z is a trifunctional amino acid that presents each of X, Y and Q." Support for this amendment is found in the application as filed. (see published application 2005/0042771, para [0224]).

Applicant respectfully requests reconsideration and withdrawal of this rejection.

Claim 5

Claim 5 has been amended to recite "a different orientation" so as to address the point of rejection raised on page 15 of the office action.

Applicant respectfully requests reconsideration and withdrawal of this rejection.

Claim 152

This claim is amended as suggested in the Office Action to recite captured target and non-target protein.

Applicant respectfully requests reconsideration and withdrawal of this rejection.

Claim 169

This claim is amended as suggested in the Office Action to recite the said exposure from claim 1.

Applicant respectfully requests reconsideration and withdrawal of this rejection.

Claim 144

This claim is amended as suggested in the Office Action to recite captured and protein.

Applicant respectfully requests reconsideration and withdrawal of this objection.

In view of the foregoing, reconsideration and allowance of claims 1, 2, 5, 6, 10, 17, 44, 75, 110, 116, 137, 139, 144, 151, 152, 160, 161,163, 164, 166, 169, and 175 are solicited.

In the event the Examiner should still find any of the claims to be unpatentable, counsel would appreciate receiving a telephone call so that, if possible, patentable language can be worked out. In the alternative, the entry of the amendment is requested, as it is believed to place the application in better condition for appeal, without requiring extension of the field of search.

Petition for extension is herewith made. The extension fee for response within a period of two (2) months pursuant to Section 1.136(a) in the amount of $490.00 in accordance with Section 1.17 is enclosed herewith. Please charge any other fees that might be due with respect to Sections 1.16 and 1.17 to Deposit Account Number 12-1099 of Lerner Greenberg Stemer LLP.

Respectfully submitted,

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